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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/070,048	02/22/2002	Hideo Nishino	SAEG106.001APC	9472

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EXAMINER	
WONG, EDNA	

ART UNIT	PAPER NUMBER
1753	

DATE MAILED: 12/10/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/070,048	NISHINO ET AL.	
	Examiner	Art Unit	
	Edna Wong	1753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-4 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-4 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 22 February 2002 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). See Other .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☒ Other: *See Continuation Sheet.*

Continuation of Attachment(s) 6). Other: May 24, 2002; June 10, 2002; July 26, 2002.

Drawings

The proposed drawings were received on February 22, 2002. These drawings are approved by the Examiner.

Specification

The disclosure is objected to because of the following informalities:

page 9, line 23, there is no "Fig. 13".

page 10, line 5, there is no "Fig. 14".

page 11, line 13, the word "enanitiomers" should be amended to -- enantiomers --.

Appropriate correction is required.

The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 112

Claims **1-4** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1

line 4, "the starting material" lacks antecedent basis.

line 4, "the product" lacks antecedent basis.

Claim 2

lines 7-8, it appears that the "right- and left- circularly polarized light" is the same as that recited in claim 1, lines 7-8. However, it is unclear if it is.

If it is, then it is suggested that the word -- the -- be inserted after the word "by".

If not, then what is the difference between the two?

Claim 3

lines 9-10, it appears that the "right- and left- circularly polarized light" is the same as that recited in claim 1, lines 7-8. However, it is unclear if it is.

If it is, then it is suggested that the word -- the -- be inserted after the word "by".

If not, then what is the difference between the two?

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

I. Claims **1 and 4** are rejected under 35 U.S.C. 102(a) as being anticipated by **Nishino et al.** ("Absolute Asymmetric Synthesis of Norbornadiene and Quadricyclane Derivatives With Circularly Polarized Light: First Reversible Asymmetric Photoisomerization Between Norbornadienes and Quadricyclanes With Circularly Polarized Light', Proceedings II of 1999 76th National Meeting of Chemical Society of Japan, March 15, 1999, translation, pp. 1-3).

Nishino teaches a method for synthesizing absolute asymmetry which comprises:

(a) providing a photochemically reversible reaction system in which the starting material (= norbornadiene) and the product (= quadricyclane) are mixtures of enantiomers or diastereomers not photochemically or thermally converted into each other; and

(b) irradiating the reaction system with right- or left- circularly polarized light (= *r*-CPL or *l*-CPL) to excite the starting material alone or both of the starting material and the product, thereby concentrating one of the enantiomers or diastereomers in the starting material (= enantiomeric enrichment of the reactant **1**) and one of the enantiomers or diastereomers in the product that corresponds to the enantiomer or

diastereomer not concentrated in the starting material (= enantiomeric enrichment of the product **2**) [pages 1-3, esp., page 2, Figure].

The starting material and the product are mixtures of enantiomers and only the starting material is excited (**1** → **2**) [pages 1-3, esp., page 2, Figure].

The material and the product are mixtures of enantiomers and both of the starting material and the product are excited (**1** ⇌ **2**) [pages 1-3, esp., page 2, Figure].

II. Claim **1** is rejected under 35 U.S.C. 102(a) as being anticipated by **Salam et al.** ("On Enantiomeric Excesses Obtained From Racemic Mixtures by Using Circularly Polarized Pulsed Lasers of Varying Durations", Chemical Physics, Vol. 228 (1998), pp. 115-129).

Salam teaches a method for synthesizing absolute asymmetry which comprises:

(a) providing a photochemically reversible reaction system in which the starting material and the product are mixtures of enantiomers (= L_g and R_g) or diastereomers not photochemically or thermally converted into each other; and

(b) irradiating the reaction system with right- or left- circularly polarized light (= left-handed circularly polarized light radiation) to excite the starting material alone or both of the starting material and the product, thereby concentrating one of the enantiomers or diastereomers in the starting material and one of the enantiomers or diastereomers in the product that corresponds to the enantiomer or diastereomer not concentrated in the starting material (pages 118-126, "3. Applications").

The starting material and the product are mixtures of enantiomers and only the starting material is excited (the left- and right- handed enantiomers of the chiral molecules) [page 118, "3. Applications].

The material and the product are mixtures of enantiomers and both of the starting material and the product are excited (page 124, Fig. 4).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

I. Claims **2 and 3** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Nishino et al.** ("Absolute Asymmetric Synthesis of Norbornadiene and Quadricyclane Derivatives With Circularly Polarized Light: First Reversible Asymmetric Photoisomerization Between Norbornadienes and Quadricyclanes With Circularly Polarized Light', Proceedings II of 1999 76th National Meeting of Chemical Society of Japan, March 15, 1999, translation, pp. 1-3) as applied to claims 1 and 4 above, and further in view of Applicants' admitted prior art (specification, page 2, line 1 to page 3, line 15).

Nishino is as applied above and incorporated herein.

Nishino does not teach wherein the concentration of one of the enantiomers in the starting material and one of the enantiomers in the product being controlled by adjusting the anisotropic factor *g* which indicates the degree of selective excitation by right- and left-circularly polarized light.

However, Applicants teach that the anisotropic factor, also known as "*g*", is considered to determine the degree of selective excitation. The anisotropic factor was defined by Kuhn as the difference between optical isomers in molar absorption coefficient for *r*- or *l*-CPL at a certain wavelength (specification, page 2, line 1 to page 3, line 15).

Thus, the invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made because one skilled in the art would have been motivated to have modified the method of Nishino with wherein the concentration of one of the enantiomers in the starting material and one of the enantiomers in the product being controlled by adjusting the anisotropic factor *g* which indicates the degree of selective excitation by right- and left-circularly polarized light because the two enantiomers in the starting material are photochemically decomposed in different extents depending upon the degree of their selective excitation by irradiation with *r*- and *l*-CPL at a certain wavelength as taught by Applicants' admitted prior art (specification, page 2, line 1 to page 3, line 15).

Furthermore, Nishino teaches that the optical purity of the product **2** at the initial stage of the reaction was in agreement with g/2 ($g = \Delta\varepsilon/\varepsilon$) as calculated from the derived equation (page 3).

As to wherein the concentration of one of the enantiomers in the starting material and one of the enantiomers the product being controlled by adjusting at least one of the following: the value of anisotropic factor *g* which indicates the degree of selective excitation by right- and left- circularly polarized light; plus or minus sign of *g*; and *K* indicating the photochemical equilibrium of the reaction, the two enantiomers in the starting material are photochemically decomposed in different extents depending upon the degree of their selective excitation by irradiation with *r*- and *l*-CPL at a certain wavelength as taught by Applicants' admitted prior art (specification, page 2, line 1 to page 3, line 15).

Furthermore, Nishino teaches that the optical purity of the product **2** at the initial stage of the reaction was in agreement with g/2 ($g = \Delta\varepsilon/\varepsilon$) as calculated from the derived equation (page 3).

II. Claims **2 and 3** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Salam et al.** ("On Enantiomeric Excesses Obtained From Racemic Mixtures by Using Circularly Polarized Pulsed Lasers of Varying Durations", Chemical Physics, Vol. 228 (1998), pp. 115-129) as applied to claim 1 above, and further in view of Applicants'

admitted prior art (specification, page 2, line 1 to page 3, line 15).

Salam is as applied above and incorporated herein.

Salam does not teach wherein the concentration of one of the enantiomers in the starting material and one of the enantiomers in the product being controlled by adjusting the anisotropic factor *g* which indicates the degree of selective excitation by right- and left-circularly polarized light.

However, Applicants teach that the anisotropic factor, also known as "*g*", is considered to determine the degree of selective excitation. The anisotropic factor was defined by Kuhn as the difference between optical isomers in molar absorption coefficient for *r*- or *l*-CPL at a certain wavelength (specification, page 2, line 1 to page 3, line 15).

Thus, the invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made because one skilled in the art would have been motivated to have modified the method of Salam with wherein the concentration of one of the enantiomers in the starting material and one of the enantiomers in the product being controlled by adjusting the anisotropic factor *g* which indicates the degree of selective excitation by right- and left-circularly polarized light because the two enantiomers in the starting material are photochemically decomposed

in different extents depending upon the degree of their selective excitation by irradiation with *r*- and *l*-CPL at a certain wavelength as taught by Applicants' admitted prior art (specification, page 2, line 1 to page 3, line 15).

As to wherein the concentration of one of the enantiomers in the starting material and one of the enantiomers the product being controlled by adjusting at least one of the following: the value of anisotropic factor *g* which indicates the degree of selective excitation by right- and left- circularly polarized light; plus or minus sign of *g*; and *K* indicating the photochemical equilibrium of the reaction, the two enantiomers in the starting material are photochemically decomposed in different extents depending upon the degree of their selective excitation by irradiation with *r*- and *l*-CPL at a certain wavelength as taught by Applicants' admitted prior art (specification, page 2, line 1 to page 3, line 15).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edna Wong whose telephone number is (703) 308-3818. The examiner can normally be reached on Mon-Fri 7:30 am to 5:00 pm, alt. Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (703) 308-3322. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1495.

Edna Wong
Primary Examiner
Art Unit 1753

EW
December 2, 2003